

REMARKS

The specification has been amended to correct a minor typographical error. Claims 1, 3, 4, 10, 11, 13, 15, 16 and 20 have been amended to improve form, claim 2 has been canceled without prejudice or disclaimer and new claim 21 has been added. Claims 1 and 3-21 are now pending in this application.

Claims 11 and 20 have been objected to for minor informalities. Claims 11 and 20 have hereby been amended in accordance with the Examiner's suggestions. Accordingly, withdrawal of the objections is respectfully requested.

Claims 1, 5 and 16-18 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Cleeves et al. (U.S. Patent No. 6,580,124; hereinafter Cleeves). The rejection is respectfully traversed.

Claim 1, as amended, incorporates a feature previously recited in original claim 2, which was not rejected based on Cleeves. Claim 16, as amended, recites a similar feature as that recited in original claim 2. Therefore, claims 1 and 16 as amended, along with their dependent claims 5, 17 and 18, are believed to be allowable over Cleeves. Accordingly, withdrawal of the rejection of claims 1, 5 and 16-18 based on Cleeves is respectfully requested.

Claims 10, 12 and 13 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Lee et al. (U.S. Patent Publication No. 2002/0028541; hereinafter Lee). The rejection is respectfully traversed.

Claim 10, as amended, incorporates a feature similar to that recited in original claim 2, which was not rejected based on Lee. Therefore, claim 10 as amended, along with its dependent

claims 12 and 13, is believed to be allowable over Lee. Accordingly, withdrawal of the rejection of claims 10, 12 and 13 based on Lee is respectfully requested.

Claims 1, 2, 4, 5, and 16-20 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Hagemeyer (U.S. Patent No. 6,768,166). The rejection is respectfully traversed.

Claim 1 recites a memory device that includes a first conductive layer a conductive structure, a plurality of dielectric layers and a control gate. Claim 1, as amended, recites that the conductive structure has a substantially cylindrical shape and is formed on the first conductive layer. The conductive structure has a first end and a second end opposite the first end, where the first end is disposed adjacent the portion of the first conductive layer that acts as the source region for the memory device and the second end acts as a drain region for the memory device. Claim 1 also recites that the plurality of dielectric layers are formed around at least a portion of the conductive structure, where at least one of the dielectric layers acts as a floating gate electrode for the memory device. Claim 1, as amended, also recites that a top portion of the second end of the conductive structure does not contact any of the plurality of dielectric layers.

As to claim 1, the Office Action states that the combination of elements 104 and 109 of Hagemeyer is equivalent to the claimed conductive structure and layers 105-107 are equivalent to the claimed plurality of dielectric layers (Office Action – pages 6-7). Claim 1 as amended, however, recites that that a top portion of the second end of the conductive structure does not contact any of the plurality of dielectric layers. The second end of the conductive structure acts as the drain region for the memory device, as also recited in claim 1. Hagemeyer discloses that drain region 109 is located at the top end of channel region 104 (Hagemeyer – Fig. 1 and abstract).

Hagemeyer also discloses that channel region 104 and drain region 109 contact dielectric layer 105 along the entire length of channel region 104 and drain region 109 (Hagemeyer – Figs. 1 and 5-9). Hagemeyer, therefore, does not disclose or suggest that the top portion of either channel region 104 or drain region 109 does not contact dielectric layer 105, as required by amended claim 1.

For at least this reason, Hagemeyer does not disclose or suggest each of the features of amended claim 1. Accordingly, withdrawal of the rejection and allowance of claim 1 are respectfully requested.

Claims 4 and 5 are dependent on claim 1 and are believed to be allowable for at least the reasons claim 1 is allowable. In addition, these claims recite additional features not disclosed or suggested by Hagemeyer.

For example, claim 4 recites that the memory device includes an insulating layer formed on the first conductive layer. Claim 4, as amended, further recites that the insulating layer contacts the first end of the conductive structure. The Office Action states that layer 801 of Hagemeyer is equivalent to the claimed insulating layer. Layer 801 of Hagemeyer is an insulation layer that is formed over gate layer 108 (Hagemeyer – Figs. 8 and 9). Hagemeyer does not disclose or suggest that insulation 801 contacts the end of channel region 104 that is adjacent the source region 103 (the first end), as required by amended claim 4.

For at least this additional reason, withdrawal of the rejection and allowance of claim 4 are respectfully requested.

Claim 16, as amended, recites features similar to claim 1. For reasons similar to those discussed above with respect to claim 1, Hagemeyer does not disclose or suggest each of the

features of amended claim 16. Accordingly, withdrawal of the rejection and allowance of claim 16 are respectfully requested.

Claims 17-20 are dependent on claim 16 and are believed to be allowable for at least the reasons claim 16 is allowable. Accordingly, withdrawal of the rejection and allowance of claims 17-20 are respectfully requested.

Claims 3 and 6-8 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Hagemeyer. The rejection is respectfully traversed.

Claims 3 and 6-8 are dependent on claim 1 and are believed to be allowable for at least the reasons claim 1 is allowable. In addition, these claims recite additional features not disclosed or suggested by Hagemeyer.

For example, as to claim 3, the Office Action admits that Hagemeyer does not disclose that structure 104/109 has a thickness ranging from about 100 Å to about 1000 Å and a width ranging from about 100 Å to about 1000 Å and that Hagemeyer discloses that structure 104/109 has a thickness and width of 1500 Å (Office Action – page 9). The Office Action further states that the change in sizes would have been obvious at the time of the invention (Office Action – page 9). The applicants respectfully disagree.

The ranges recited in claim 3 enable the claimed memory device to be formed in a much smaller area than that which could be achieved by the structure disclosed in Hagemeyer. The 1500 Å diameter for channel region 104 in Hagemeyer is significantly larger than the range recited for the conductive structure in claim 3. The applicants assert that nothing in Hagemeyer suggests modifying the 1500 Å diameter channel region 104 to the range recited in claim 3 and that such a

significant modification to the size of channel region 104 of Hagemeyer would not have been obvious to one of ordinary skill in the art based on the disclosure of Hagemeyer.

For at least this additional reason, withdrawal of the rejection and allowance of claim 3 are respectfully requested.

Claims 9-15 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Hagemeyer in view of Forbes (U.S. Patent Publication No. 2003/0235075). The rejection is respectfully traversed.

Claim 9 is dependent on claim 1 and is believed to be allowable for at least the reasons claim 1 is allowable. Forbes does not remedy the deficiencies in Hagemeyer discussed above with respect to claim 1. Accordingly, allowance of claim 9 is respectfully requested.

Claim 10, as amended, recites features similar to claim 1. For reasons similar to those discussed above with respect to claim 1, Hagemeyer does not disclose or suggest each of the features of amended claim 10. Forbes does not remedy the deficiencies in Hagemeyer with respect to claim 10. Accordingly, withdrawal of the rejection and allowance of claim 10 are respectfully requested.

Claims 11-15 are dependent on claim 10 and are believed to be allowable over the combination of Hagemeyer and Forbes for at least the reasons claim 10 is allowable. In addition, these claims recite additional features not disclosed or suggested by the combination of Hagemeyer and Forbes.

For example, claim 15, as amended, recites features similar to claim 4. For reasons similar to those discussed above with respect to claim 4, Hagemeyer does not disclose or suggest the

features of claim 15. Forbes does not remedy the deficiencies in Hagemeyer with respect to claim 15. For at least these additional reasons, withdrawal of the rejection and allowance of claim 15 are respectfully requested.

NEW CLAIM

New claim 21 has been added. Claim 21 is dependent on claim 16 and is believed to be allowable for at least the reasons claim 16 is allowable. In addition, claim 21 recites features similar to claim 4. For reasons similar to those discussed above with respect to claim 4, the art of record does not disclose or suggest the features of claim 21. Accordingly, allowance of claim 21 is respectfully requested.


CONCLUSION

In view of the foregoing amendments and remarks, the applicants respectfully request withdrawal of the outstanding rejection and the timely allowance of this application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

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Date: December 9, 2004

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